

Notice of Allowability

Application No.

10/017,520

Examiner

Son M Tang

Applicant(s)

BLEIER, THOMAS E.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/14/01.
2. ☒ The allowed claim(s) is/are 1-27.
3. ☒ The drawings filed on 14 December 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 1/28/02 and 5/5/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 11/23/04.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Robin C. Chiang on Nov. 18, 2004.

The application has been amended as follows:

Claims 1, 7, 25 and 27,

1. A method of monitoring an earthquake comprising:
 - a) detecting an electromagnetic signal emanating from and characterizing an earthquake using at least one satellite;
 - b) using said electromagnetic signal detected by said satellites to locate an area on earth from which the electromagnetic signal was generated;
 - c) using at least one ground detector to verify the existence of said electromagnetic signal; and
 - d) using said ground detectors to precisely locate said electromagnetic signal.

7. A satellite and ground system of monitoring an earthquake, comprising:
 - a) at least one satellite comprising:
 - i) a 3-axis search coil magnetometer for generating an extremely low frequency (ELF) data signal in response to an electromagnetic signal emanating from and characterizing an earthquake;

- ii) data storage that can store the ELF data signals, along with the time the signal was detected and the location of said satellite when said ELF data signal is detected; and
 - iii) a transmitter to transmit said data through a cooperating ground station to a control center after said satellite collects said ELF signal;
- b) one or more portable ground detectors comprising:
- i) a 3-axis search coil magnetometer
 - ii) data storage that can store raw ELF data, location of ground detector and time said ELF data was received; and
 - iii) a transmitter to send said ELF data to said control center;
- c) ~~A~~ a control center comprising:
- i) a network connection to the internet or other network to allow the uploading and downloading of earthquake related data
 - ii) one or computers to process said earthquake related data.

25 A method of processing earthquake data comprising:

- a) generating an extremely low frequency (ELF) data signal from a satellite in response to an electromagnetic signal emanating from and characterizing an earthquake
- a) ~~b)~~ downloading said ELF data in a particular region from a said satellite;
 - b) ~~c)~~ comparing said ELF data to a threshold value in a database;
 - e) ~~d)~~ checking a database for solar flare activity;
 - d) ~~e)~~ calculating a reverse propagation path of said ELF data;
 - e) ~~f)~~ comparing said ELF data with historical earthquake data in said region;

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- f) g) waiting for said satellite to make another orbit, and reverify said ELF data and;
- g) h) placing ground monitors in locations around origin of said ELF data to determine a centroid of ELF activity.

27 A method of locating an extremely low frequency (ELF) signal comprising:

- a) generating an ELF data signal from a satellite in response to an electromagnetic signal emanating from and characterizing an earthquake
- a) b) calculating an estimated centerpoint of an said ELF signal based on data received from a said satellite;
- b) c) deploying a ground monitor at said centerpoint;
- e) d) deploying one or more ground monitors on the fault line near the centerpoint;
- d) e) determining which ground monitor has the highest root mean squared (rms) data output;
- e) f) moving all other monitors except that determined in step d) e) in a cross-track orientation to the fault line to determine if the source is on the main fault trace or a splinter fault in close proximity;
- f) g) repeat steps d) e) and e) f) as necessary to locate the signal to a determined threshold distance.

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2. The following is an examiner's statement of reasons for allowance: The present invention is directed to a method of monitoring an earthquake. Each independent claim identifies the uniquely distinct features "satellite detecting an electromagnetic emanating from and characterizing the earthquake" and "using a ground detector to precisely locate the centroid of extremely low frequency that verify the existence earthquake activity" in combination with the manner claimed. The closest prior arts Kushida US 6,018,244 and Hoffman et al. US 4,193,570 disclose of using orbit satellite to predicting earthquake, however either singularly or in combination, fail to anticipate or render the above limitations obvious.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Son M Tang whose telephone number is (571)272-2962. The examiner can normally be reached on 4/9 First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel J Wu can be reached on (571)272-2964. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Son Tang


BENJAMIN C. LEE
PRIMARY EXAMINER